



April 3, 2015

L-2015-088  
10 CFR 50.73

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D.C. 20555

Re: St. Lucie Unit 2  
Docket No. 50-389  
Reportable Event: 2014-002-01  
Date of Event: November 12, 2014  
Unit 2 Shutdown Due to Spurious Closure of Main Feed Isolation Valve (MFIV)

The attached Licensee Event Report 2014-002-01 supplement is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Respectfully,

A handwritten signature in black ink, reading 'Christopher R. Costanzo', is written over the typed name.

Christopher R. Costanzo  
Site Vice President  
St. Lucie Plant

CRC/dlc

Attachment

IEZ2  
NRR

**LICENSEE EVENT REPORT (LER)**(See Page 2 for required number of  
digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

<b>1. FACILITY NAME</b> St. Lucie Unit 2	<b>2. DOCKET NUMBER</b> 05000389	<b>3. PAGE</b> 1 OF 3
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<b>4. TITLE</b> Unit 2 Shutdown Due to Spurious Closure of Main Feed Isolation Valve (MFIV)
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5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	12	2014	2014	002	01	4	03	15		DOCKET NUMBER

<b>9. OPERATING MODE</b>	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)</b>			
1	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
<b>10. POWER LEVEL</b>  100	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

<b>12. LICENSEE CONTACT FOR THIS LER</b>	
LICENSEE CONTACT Don L. Cecchetti, Licensing Engineer	TELEPHONE NUMBER (Include Area Code) (772) 467-7155

<b>13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT</b>									
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
B	JB	RLY	G080	Y					

<b>14. SUPPLEMENTAL REPORT EXPECTED</b> <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	<b>15. EXPECTED SUBMISSION DATE</b> MONTH DAY YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On November 12, 2014 Unit 2 was in Mode 1 at 100 percent power when the 2B steam generator main feedwater isolation valve (MFIV) HCV-09-2B spuriously stroked closed. This resulted in a manual reactor trip of Unit 2 due to rapidly lowering steam generator water level. The reactor trip was normal and uncomplicated. All safety related systems functioned as designed. There were no unexpected automatic safety system actuations as a result of the trip.

A root cause evaluation (RCE) determined the spurious closure of the MFIV was a result of an insufficient preventive maintenance (PM) strategy to detect and mitigate environmental conditions that would affect the MFIV HCV-09-2B relay box. Corrective actions included replacement of the relays in the MFIV relay boxes and moving or eliminating the relay components by modification. This condition is reportable in accordance with the following requirements: 1) 10 CFR 50.73(a)(2)(i)(A) and 2) 10 CFR 50.73(a)(2)(iv)(A). This supplement revises the cause, corrective actions and operating experience (OE) for this event. This event was determined to have minimal safety significance and no impact on the health and safety of the public.

**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
St. Lucie Unit 2	05000389	YEAR	SEQUENTIAL NUMBER	REV NO.	2 OF 3
		2014	- 002	- 01	

**NARRATIVE****Description of the Event**

On November 12, 2014 Unit 2 was manually tripped due to a lowering 2B steam generator level caused by the spurious (slow) closure of 2B steam generator main feedwater isolation valve (MFIV) [EIIS:JB], HCV-09-2B. All control element assemblies (CEAs) fully inserted into the core. All safety systems responded as expected with the auxiliary feedwater actuation system channel 2 (AFAS 2) actuating on low 2B steam generator level. Decay heat removal was from main feedwater to the 2A steam generator and manual control of auxiliary feedwater to the 2B steam generator.

**Cause of the Event**

A root cause evaluation (RCE) determined the MFIV HCV-09-2B spuriously stroked closed in the slow mode as a result of a preventive maintenance (PM) strategy that was insufficient to detect and mitigate the single point vulnerability induced by the environmental conditions affecting the relay box. Contributing causes included 1) the relay box for HCV-09-2B was insufficient in controlling humidity in the environment experienced by the relays in the steam trestle area that would ensure non-safety function reliability and 2) a previous RCE performed for HCV-09-2A spurious closure, identified an issue with top entry conduits into electrical boxes.

**Analysis of Safety Significance**

The safety function of HCV-09-2B is to close in response to a main steam isolation signal, or an auxiliary feedwater actuation signal (AFAS). Spurious closure of HCV-09-2B isolated feedwater to the 2B steam generator, resulting in lowering level. When lowering steam generator level was approaching the 50 percent narrow range operating limit, a manual trip was initiated in accordance with site procedure. The trip was uncomplicated and the Unit 2 risk remained Green. The AFAS actuated on low steam generator narrow range level as expected for the plant conditions during the event. There were no unexpected automatic safety system actuations as a result of the trip.

This event is reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A) for the reactor protection system (RPS) and AFAS actuation and 10 CFR 50.73(a)(2)(i)(A) for a plant shutdown required by technical specifications. All plant systems responded as designed and there was minimal safety significance associated with this event.

LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
St. Lucie Unit 2	05000389	2014	- 002	- 01	3 OF 3

## NARRATIVE

**Corrective Actions**

The corrective actions listed below are entered into the site corrective action program. Any changes to the actions will be managed under the corrective action program.

**Completed Actions**

1. Replaced the degraded relays 3Y/672 and HCV-09-2B for HCV-09-2B.
2. Installed conduit seals on conduit leading to the HCV-09-2B relay box.
3. Sealed remaining conduit to MFIV relay boxes to the HCV-09-1A relay box.
4. Replaced degraded relays in the HCV-09-2A relay box.

**Corrective Actions**

1. Modify Unit 2 MFIVs to eliminate location of relays in adverse environment.
2. Replace HFA and HGA relays in the Unit 2 MFIV relay boxes in conjunction with 0-PME-100.10 18 month PM (SL2-22).

**SIMILAR EVENTS**Internal OE

A review of similar events identified two previous related events:

- St. Lucie LER 2013-004-00, "Manual Trip Following Spurious Closure of Main Feedwater Isolation Valve (MFIV) and Lowering of Steam Generator Levels," involved an MFIV closing as a result of corrosion of two relays (3Y/671 or 20X/671) located inside the relay box caused by internal water intrusion in the conduits. Corrective actions included replacing the degraded relays and installing internal conduit seals. The RCE performed for HCV-09-2A spurious closure identified an issue with top entry conduits to electrical boxes but did not create a corrective action to seal the similar HCV-09-2B relay box.

For moisture intrusion, St. Lucie has revised a PM activity which addresses electrical box degradation on a pre-determined population. Procedure, 0-PME-100.10, "Periodic Inspection of Electrical Boxes and Cabinets,". There were no additional actions needed to address the concerns from this information notice.

**Failed Component(s)**

Model No. 12HFA151A2H - HFA Relay

Manufacturer: General Electric